

**ABSTRACT**

A method for chemical mechanical polishing (CMP) of a shallow trench isolation (STI) structure employs a sequence of slurry polishes. In the first step the substrate is polished with either silica-based slurry or diluted ceria-based slurry. The first polishing is at a higher removal rate than the second polishing step. The polishing proceeds with some planarization but does not expose the polish stop layer. After partial planarization, the high selectivity slurry was used to complete the process. Improved throughput, lower defects and good within wafer uniformity are achieved.